Empirical Data Packet No. 2 for Econ 502: Financial Crises and the US “Great Recession”

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“In the long run we are all dead. Economists set themselves too easy, too useless a task if in tempestuous seasons they can only tell us that when the storm is long past the ocean is flat again”

J. M. Keynes *Tract on Monetary Reform* 1924
Flows of Funds Through U.S. Financial System

Loans by Banks and Other Financial Intermediaries

INDIRECT FINANCE

FUNDS

Financial Intermediaries

FUNDS

DIRECT FINANCE

Lender/saver purchases of initial public offerings (IPOs) of stocks, bonds, and other securities in “primary” (initial sale) security markets

Lender-Savers
1. Households
2. Business firms
3. Government
4. Foreigners

FUNDS

Financial Markets

FUNDS

FUNDS

Borrower-Spenders
1. Business firms
2. Government
3. Households
4. Foreigners
# Principal Regulatory Agencies of the U.S. Financial System

<table>
<thead>
<tr>
<th>Founded:</th>
<th>Securities and Exchange Commission (SEC)</th>
<th>Organized exchanges and financial markets</th>
<th>Requires disclosure of information, restricts insider trading</th>
</tr>
</thead>
<tbody>
<tr>
<td>1933</td>
<td>Commodities Futures Trading Commission (CFTC)</td>
<td>Futures market exchanges</td>
<td>Regulates procedures for trading in futures markets</td>
</tr>
<tr>
<td>1863</td>
<td>Office of the Comptroller of the Currency</td>
<td>Federally chartered commercial banks</td>
<td>Charters and examines the books of federally chartered commercial banks and imposes restrictions on assets they can hold</td>
</tr>
<tr>
<td>1934</td>
<td>National Credit Union Administration (NCUA)</td>
<td>Federally chartered credit unions</td>
<td>Charters and examines the books of federally chartered credit unions and imposes restrictions on assets they can hold</td>
</tr>
<tr>
<td>1780s</td>
<td>State banking and insurance commissions</td>
<td>State-chartered depository institutions</td>
<td>Charter and examine the books of state-chartered banks and insurance companies, impose restrictions on assets they can hold, and impose restrictions on branching</td>
</tr>
<tr>
<td>1933</td>
<td>Federal Deposit Insurance Corporation (FDIC)</td>
<td>Commercial banks, mutual savings banks, savings and loan associations</td>
<td>Provides insurance of up to $100,000 (temporarily $250,000) for each depositor at a bank, examines the books of insured banks, and imposes restrictions on assets they can hold</td>
</tr>
<tr>
<td>1989</td>
<td>Office of Thrift Supervision</td>
<td>Savings and loan associations</td>
<td>Examines the books of savings and loan associations, imposes restrictions on assets they can hold</td>
</tr>
</tbody>
</table>

US central bank founded in 1913
The U.S. Federal Reserve System

Source: Federal Reserve Bulletin.
**Federal Reserve: Organizational Structure and Traditional Types of Policy Tools**

**Chairman:**
- 4-Year Term

**Six Others:**
- 14-Year Terms

**Fed Reserve Goals:**
“…maximum employment, stable prices, and moderate long-term interest rates.”

\[ G - tY = \Delta M + \Delta B \]
Links Between Monetary Policy and GDP: Complicated Monetary Transmission Mechanisms
Linkages Between Central Bank Tools, Policy Instruments, Intermediate Targets, and Policy Goals

NOTES:
1) The *discount rate* is the interest rate charged to commercial banks and other depository institutions on loans they receive from their regional Federal Reserve Bank's lending facility—the discount window.
2) **Open-Market Operations** = Central bank buys and sells (short term) gov’t bonds from/to the private sector in an attempt to keep interest rates at specified target levels.
3) **Quantitative Easing (QE)** is when a central bank buys financial assets (mortgage-backed securities, long-term Treasury bonds,…) from the private sector in order to inject a pre-determined amount of money into the economy.
### Summary

#### Adoptions of Various Monetary Policy Strategies

<table>
<thead>
<tr>
<th>Monetary Policy</th>
<th>Inflation Policy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Monetary Targeting</strong></td>
<td>“Taylor Rule” <strong>1990-2007</strong></td>
</tr>
<tr>
<td><strong>Advantages</strong></td>
<td><strong>Advantages</strong></td>
</tr>
<tr>
<td>Immediate signal on achievement of target</td>
<td>Simplicity and clarity of target</td>
</tr>
<tr>
<td>Does not rely on stable money–inflation relationship</td>
<td>Does not rely on stable money–inflation relationship</td>
</tr>
<tr>
<td>Increased accountability of central bank</td>
<td>Increased accountability of central bank</td>
</tr>
<tr>
<td>Reduced effects of inflationary shocks</td>
<td>Reduced effects of inflationary shocks</td>
</tr>
<tr>
<td>Relies on stable money–inflation relationship</td>
<td>Delayed signal about achievement of target</td>
</tr>
<tr>
<td>Could impose rigid rule (though has not in practice)</td>
<td>Could impose rigid rule (though has not in practice)</td>
</tr>
<tr>
<td>Larger output fluctuations if sole focus on inflation (though not in practice)</td>
<td>Larger output fluctuations if sole focus on inflation (though not in practice)</td>
</tr>
<tr>
<td><strong>Disadvantages</strong></td>
<td><strong>Disadvantages</strong></td>
</tr>
<tr>
<td><strong>Discretionary Policy</strong> (Implicit nominal anchoring on inflation control via setting of fed funds rate targets etc.,..)</td>
<td><strong>Discretionary Policy</strong> (Implicit nominal anchoring on inflation control via setting of fed funds rate targets etc.,..)</td>
</tr>
<tr>
<td>Adopted by central banks in New Zealand, Canada, UK, Sweden, Finland, Australia, Spain…</td>
<td>Adopted by central banks in New Zealand, Canada, UK, Sweden, Finland, Australia, Spain…</td>
</tr>
</tbody>
</table>
Fed switched from M1 to M2 money supply measure in 1987

Fed Chairman Greenspan announces in 1993 Fed would no longer use monetary targets (including M2) as guides for monetary policy, instead would rely more on fed funds rate targets to control inflation.

Did Greenspan in effect use a “Taylor Rule” monetary policy for setting fed funds rate?

Taylor Rule (Simple Form) for the setting of the fed funds rate $i$:

$$[i - i^*] = a [\pi - \pi^*] + b \frac{Y - Y^*}{Y^*},$$

where

- $i$ = interest rate, $i^*$ = target interest rate, $\pi$ = inflation rate, $\pi^*$ = target inflation rate
- $Y$ = real GDP, $Y^*$ = potential (target) real GDP, and $\frac{Y - Y^*}{Y^*}$ = real GDP gap

*Data Source:* Federal Reserve: [www.federalreserve.gov/releases](http://www.federalreserve.gov/releases)
Inflation targeting appears to have been successful in 1990s in bringing down the inflation rate in three countries that adopted a Taylor-rule monetary policy.

But, was the decrease in inflation actually due to the inflation-targeting?

And what was happening with regard to other key economic indicators?

See [*] P. Howitt, “What Have Central Bankers Learned…” J of Macro 2012, 11-22, Syllabus Section VI.A.
Financial Crisis ("Bank Crisis")

- A major disruption in financial markets characterized by
  - A sharp decline in asset prices
  - Failures of many financial & nonfinancial firms
Financial Crises Throughout World Since 1970

## The Cost of Rescuing Banks During Financial Crises in Several Countries

<table>
<thead>
<tr>
<th>Date</th>
<th>Country</th>
<th>Cost as a Percentage of GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980–1982</td>
<td>Argentina</td>
<td>55</td>
</tr>
<tr>
<td>1997–2002</td>
<td>Indonesia</td>
<td>55</td>
</tr>
<tr>
<td>1990s–ongoing</td>
<td>China</td>
<td>47</td>
</tr>
<tr>
<td>1996–2000</td>
<td>Jamaica</td>
<td>44</td>
</tr>
<tr>
<td>1981–1983</td>
<td>Chile</td>
<td>42</td>
</tr>
<tr>
<td>1997–2002</td>
<td>Thailand</td>
<td>35</td>
</tr>
<tr>
<td>1993–1994</td>
<td>Macedonia</td>
<td>32</td>
</tr>
<tr>
<td>2000–ongoing</td>
<td>Turkey</td>
<td>31</td>
</tr>
<tr>
<td>1977–1983</td>
<td>Israel</td>
<td>30</td>
</tr>
<tr>
<td>1997–2002</td>
<td>South Korea</td>
<td>28</td>
</tr>
<tr>
<td>1988–1991</td>
<td>Cote d’Ivoire</td>
<td>25</td>
</tr>
<tr>
<td>1991–ongoing</td>
<td>Japan</td>
<td>24</td>
</tr>
<tr>
<td>1994–1995</td>
<td>Venezuela</td>
<td>22</td>
</tr>
<tr>
<td>1998–2001</td>
<td>Ecuador</td>
<td>20</td>
</tr>
<tr>
<td>1994–2000</td>
<td>Mexico</td>
<td>19</td>
</tr>
<tr>
<td>1997–2001</td>
<td>Malaysia</td>
<td>16</td>
</tr>
<tr>
<td>1992–1994</td>
<td>Slovenia</td>
<td>15</td>
</tr>
<tr>
<td>1998–ongoing</td>
<td>Philippines</td>
<td>13</td>
</tr>
<tr>
<td>1994–1999</td>
<td>Brazil</td>
<td>13</td>
</tr>
<tr>
<td>1995–2000</td>
<td>Paraguay</td>
<td>13</td>
</tr>
<tr>
<td>1989–1991</td>
<td>Czech Republic</td>
<td>12</td>
</tr>
<tr>
<td>1997–1998</td>
<td>Taiwan</td>
<td>12</td>
</tr>
<tr>
<td>1991–1994</td>
<td>Finland</td>
<td>11</td>
</tr>
<tr>
<td>1989–1990</td>
<td>Jordan</td>
<td>10</td>
</tr>
<tr>
<td>1991–1995</td>
<td>Hungary</td>
<td>10</td>
</tr>
<tr>
<td>1990–1993</td>
<td>Norway</td>
<td>8</td>
</tr>
<tr>
<td>1991–1994</td>
<td>Sweden</td>
<td>4</td>
</tr>
<tr>
<td>1988–1991</td>
<td>United States</td>
<td>3</td>
</tr>
</tbody>
</table>

Key Puzzle About Many Observed Financial Crises

- How can a country shift so dramatically from a path of reasonable growth **before** a financial crisis to a sharp decline in economic activity **after** a crisis occurs?

  **Possible Explanation:** Role of *positive feedback (reinforcement)* in which an initial shock (trigger event) leads to subsequent events that *amplify* the original shock.

  **Example:** Deflation reduces borrowing for new spending, which further deflates prices.
Effects of US President Roosevelt's 1933-1938 "New Deal" legislation

Table 10-2: What Happened During the Great Depression?

<table>
<thead>
<tr>
<th>Year</th>
<th>Unemployment Rate</th>
<th>Real GNP</th>
<th>Real Consumption</th>
<th>Real Investment</th>
<th>Real Government Purchases</th>
</tr>
</thead>
<tbody>
<tr>
<td>1929</td>
<td>3.2</td>
<td>203.6</td>
<td>139.6</td>
<td>40.4</td>
<td>22.0</td>
</tr>
<tr>
<td>1930</td>
<td>8.9</td>
<td>183.5</td>
<td>130.4</td>
<td>27.4</td>
<td>24.3</td>
</tr>
<tr>
<td>1931</td>
<td>16.3</td>
<td>169.5</td>
<td>126.1</td>
<td>16.8</td>
<td>25.4</td>
</tr>
<tr>
<td>1932</td>
<td>24.1</td>
<td>144.2</td>
<td>114.8</td>
<td>4.7</td>
<td>24.2</td>
</tr>
<tr>
<td>1933</td>
<td>25.2</td>
<td>141.5</td>
<td>112.6</td>
<td>5.3</td>
<td>23.3</td>
</tr>
<tr>
<td>1934</td>
<td>22.0</td>
<td>154.3</td>
<td>118.1</td>
<td>9.4</td>
<td>28.6</td>
</tr>
<tr>
<td>1935</td>
<td>20.3</td>
<td>169.5</td>
<td>125.5</td>
<td>18.0</td>
<td>27.0</td>
</tr>
<tr>
<td>1936</td>
<td>17.0</td>
<td>152.3</td>
<td>136.4</td>
<td>24.0</td>
<td>31.8</td>
</tr>
<tr>
<td>1937</td>
<td>14.3</td>
<td>203.2</td>
<td>143.1</td>
<td>29.9</td>
<td>30.8</td>
</tr>
<tr>
<td>1938</td>
<td>10.1</td>
<td>192.9</td>
<td>140.2</td>
<td>17.0</td>
<td>33.9</td>
</tr>
<tr>
<td>1939</td>
<td>17.2</td>
<td>200.4</td>
<td>148.2</td>
<td>24.7</td>
<td>35.5</td>
</tr>
<tr>
<td>1940</td>
<td>14.6</td>
<td>227.2</td>
<td>155.7</td>
<td>33.0</td>
<td>36.4</td>
</tr>
</tbody>
</table>

Source: Historical Statistics of the United States: Colonial Times to 1970, Parts I and II. U.S. Department of Commerce, Bureau of Census, 1975, Washington, D.C. The unemployment rate series D8, Real GNP, consumption, investment, and government purchases are series F3, F4b, F55, and F66, and are measured in billions of 1958 dollars. The interest rate is the prime Com-

Standard types of macro data shown for Great Depression (e.g., Mankiw text). Do these types of data give a sufficiently complete picture to permit economists to understand the causes of the Great Depression?
What Caused 1929-1939 US Great Depression?

Three Different Theories Proposed:

- Breakdown in financial system was simply a response to (not a cause of) an initial decline in aggregate output. *(not consistent with the empirical evidence)*

- U.S. Great Depression caused by a rapid decline in money supply -- an inappropriate monetary policy. *(“Monetarists,” e.g., Milton Friedman)*

- General disruption occurred in financial markets that then adversely affected aggregate output and prolonged the depression. *(Frederic Mishkin’s view)*

What caused 2007-2009 US “Great Recession?”
# Bond Ratings by Moody’s, Standard & Poor’s, and Fitch

(Mishkin, Table 6-1)

<table>
<thead>
<tr>
<th>Rating</th>
<th>Moody’s</th>
<th>S&amp;P</th>
<th>Fitch</th>
<th>Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aaa</td>
<td>Aaa</td>
<td>AAA</td>
<td>AAA</td>
<td>Prime Maximum Safety</td>
</tr>
<tr>
<td>Aa1</td>
<td>AA-</td>
<td>AA-</td>
<td>AA-</td>
<td>High Grade High Quality</td>
</tr>
<tr>
<td>Aa2</td>
<td>AA</td>
<td>AA</td>
<td>AA</td>
<td></td>
</tr>
<tr>
<td>Aa3</td>
<td>AA-</td>
<td>AA-</td>
<td>AA-</td>
<td></td>
</tr>
<tr>
<td>A1</td>
<td>A+</td>
<td>A+</td>
<td>A+</td>
<td>Upper Medium Grade</td>
</tr>
<tr>
<td>A2</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>A3</td>
<td>A-</td>
<td>A-</td>
<td>A-</td>
<td></td>
</tr>
<tr>
<td>Baa1</td>
<td>BBB+</td>
<td>BBB+</td>
<td>BBB+</td>
<td>Lower Medium Grade</td>
</tr>
<tr>
<td>Baa2</td>
<td>BBB</td>
<td>BBB</td>
<td>BBB</td>
<td></td>
</tr>
<tr>
<td>Baa3</td>
<td>BBB-</td>
<td>BBB-</td>
<td>BBB-</td>
<td></td>
</tr>
<tr>
<td>Ba1</td>
<td>BB+</td>
<td>BB+</td>
<td>BB+</td>
<td>Non Investment Grade</td>
</tr>
<tr>
<td>Ba2</td>
<td>BB</td>
<td>BB</td>
<td>BB</td>
<td>Speculative</td>
</tr>
<tr>
<td>Ba3</td>
<td>BB-</td>
<td>BB-</td>
<td>BB-</td>
<td></td>
</tr>
<tr>
<td>B1</td>
<td>B-</td>
<td>B-</td>
<td>B-</td>
<td>Highly Speculative</td>
</tr>
<tr>
<td>B2</td>
<td>B</td>
<td>B</td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>B3</td>
<td>B-</td>
<td>B-</td>
<td>B-</td>
<td></td>
</tr>
<tr>
<td>Caa1</td>
<td>CCC+</td>
<td>CCC</td>
<td>CCC</td>
<td>Substantial Risk</td>
</tr>
<tr>
<td>Caa2</td>
<td>CCC</td>
<td>—</td>
<td>—</td>
<td>In Poor Standing</td>
</tr>
<tr>
<td>Caa3</td>
<td>CCC-</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Ca</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>Extremely Speculative</td>
</tr>
<tr>
<td>C</td>
<td>—</td>
<td>—</td>
<td>DDD</td>
<td>May be in Default</td>
</tr>
<tr>
<td>—</td>
<td>—</td>
<td>DD</td>
<td>DD</td>
<td>Default</td>
</tr>
<tr>
<td>—</td>
<td>—</td>
<td>D</td>
<td>D</td>
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<tr>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
</tbody>
</table>

- **Junk (Below BBB)**
  - AAA: Year-1 default probability = 0.061%
  - BBB: Year-1 default probability = 0.978%
  - CCC: Year-1 default probability = 29.945%
The Making of a Mortgage CDO

The technology behind the collateralized debt obligation, or CDO, has been around since the 1980s, but only more recently has it been applied to mortgage-backed securities. It was designed to provide investors with greater diversification and disperse the risk of mortgage lending. But so-called mezzanine CDOs such as Norma actually served to magnify and concentrate the risk. Here is how they were made. Click on each step button below to learn more.

**Step 1**
The creator of a subprime residential mortgage-backed security — or RMBS — buys loans from all over the country, often from several different lenders. Several thousand loans go into one mortgage-backed security. Because the security combines the specific risks of all the individual loans into a single pool, its investors as a whole are less exposed to the potential problems of any one borrower.

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http://online.wsj.com/public/resources/documents/info-flash07.html?project=normaSubprime0712&h=530&w=980&hasAd=1&settings=normaSubprime0712
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Step 2

The residential mortgage-backed security repackages and redistributes the income from the loans among different classes of bonds. Highly rated bonds are the first to receive income and the last to suffer any losses, but they also offer the lowest return. Low-rated bonds pay a better return, but are also among the first to take any losses if borrowers reneg on the loans in the pool.

Fitch Ratings scale

- AAA
- AA+
- AA
- A+
- A
- BBB+
- BBB
- BB
- B+
- B
- CCC+
- CCC
- CCC-
- Not rated

Mouse over the key elements for more info.
The Making of a Mortgage CDO

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**Step 3**

As many as 150 mortgage-backed bonds -- or other mortgage-linked investments -- are packaged into a single CDO. In the case of a mezzanine CDO, those investments are mostly linked to pieces of mortgage-backed securities that carry a rating of triple-B, just above junk. This boosts the yield the CDO can offer, but also makes its investors more vulnerable to losses.

---

**Fitch Ratings scale**

<table>
<thead>
<tr>
<th>AAA</th>
<th>AA+</th>
<th>AA</th>
<th>A+</th>
<th>A</th>
<th>A-</th>
<th>BBB+</th>
<th>BBB</th>
<th>BBB-</th>
<th>Not rated</th>
</tr>
</thead>
</table>

Mouse over the key elements for more info.

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CDO buys various BBB bonds

RMBS

BBB Bonds

BBB Bonds

CDO Assets
The Making of a Mortgage CDO

The technology behind the collateralized debt obligation, or CDO, has been around since the 1980s, but only more recently has it been applied to mortgage-backed securities. It was designed to provide investors with greater diversification and disperse the risk of mortgage lending. But so-called mezzanine CDOs such as Norma actually served to magnify and concentrate the risk. Here is how they were made. Click on each step button below to learn more.

Step 4

Much like an RMBS, the CDO issues new bonds, each with its own level of risk and return. The pieces of the CDO with middling ratings like A or triple-B are often sold off to other CDOs.

Fitch Ratings scale

Mouse over the key elements for more info

Not rated

AAA  
AA+  
AA  
AA-  
A+  
A  
A-  
BBB+  
BBB  
BBB-  
BB+  
BB  
BB-  
B+  
B  
B-  
CCC+  
CCC  
CCC-  
CC
The Making of a Mortgage CDO

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Step 5

Investors in the lower-rated pieces of a CDO are the last to get paid and the first to take losses. This protects investors in the higher-rated pieces, as long as all the CDO’s investments don’t go bad together. The similarity of the triple-B-rated investments in a mezzanine CDO, though, increases the likelihood that they will all suffer at once.
The Making of a Mortgage CDO

The technology behind the collateralized debt obligation, or CDO, has been around since the 1980s, but only more recently has it been applied to mortgage-backed securities. It was designed to provide investors with greater diversification and disperse the risk of mortgage lending. But so-called mezzanine CDOs such as Norma actually served to magnify and concentrate the risk. Here is how they were made. Click on each step button below to learn more.

Step 6

Credit-rating firms initially gave their highest triple-A ratings to three-quarters of the securities Norma issued. But as house prices plummeted and defaults rose across the country, investors and analysts expectations of losses rose well into the range that would hit the triple-B investments that Norma contained. As a result, the value of investments in Norma plummeted, and rating companies downgraded bonds issued by Norma to junk.
US Housing Price Bubble Burst in 2006

USA vs. East North Central House Price Indices
(1991Q1=100, SA)
Federal Government Budget Deficits (G-tY > 0): Cause or Consequence of Economic Crises?

2016 Estimate: Deficit ≈ 3.2% of GDP

USA Government Budget Deficits and Surpluses as a Percentage of GDP
Source: Congressional Budget Office (http://www.cbo.gov/)
Excise Tax: A fixed amount of tax charged per item bought, e.g., $1

Sales Tax: A tax on a purchased good calculated as a percentage of the good’s purchase price. e.g., \([1.05] \times \text{price} = \text{after-tax price}\)

Source Data: OMB – 2011 Budget – Summary Table S-3

Updates 2015: $3.25 Trillion
Individual Income Taxes 47%
Payroll Taxes (SS/SI) 33%
Corporate Income Taxes 11%
Other 9%
TARP = Troubled Asset Relief Program

U.S. Federal Spending – Fiscal Year 2009 ($ Billion)

Total
$3,518 B ($3.5 trillion)

Updates 2015: $3.7 Trillion
Defense 16%
Other Discretionary 16%
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Interest 6%
Soc Sec 24%
Medicare/Medicaid 25%
Other Mandatory 13%

Source: OMB - 2011 Budget - Summary Table S-3
U.S. Federal Budget By Category %: Fiscal Year 2010

Social Security, 20%
Defense, 19%
Unemployment & other mandatory welfare spending, 16%
Medicare, 13%
Medicaid & child health, 8%
Interest, 5%

Source: Kelvin Case, en.wikipedia, 8/1/2010
US Federal Government receipts and expenditures for 2010

**Update 2015:**
Receipts ≈ $3.25 trillion
Mandatory spending ≈ $2.5 trillion

*Source: Kelvin Case, en.wikipedia*
Sometime between 2030 and 2040, mandatory spending will exceed government revenues.

Source: GAO Citizen’s Guide 2007
Medicare and Social Security Face Large Deficits

(HI=Hospital Insurance)


Note: Projections based on the intermediate assumptions of the 2007 Trustees' Reports. The CPI is used to adjust from current to constant dollars.
Debt = Accumulated value over time of deficits net of surpluses

Gross Fed Debt = Value of all debt instruments issued by the US Treasury;
Fed Debt Held by the Public

= (Gross Fed Debt) – (Fed Debt held by Fed government itself)
= Fed debt held (owned) by international investors, US private investors, US Fed Reserve Banks, & US state and local gov’ts

Source: Federal Reserve, Flow of Funds Accounts of the US, Third Quarter, 2010
Education pays

Unemployment rate in 2009
- Doctoral degree: 2.5
- Professional degree: 2.3
- Master's degree: 3.9
- Bachelor's degree: 5.2
- Associate degree: 6.8
- Some college, no degree: 8.6
- High school graduate: 9.7
- Less than a high school diploma: 14.6
- Average, all workers: 7.9

Median weekly earnings in 2009
- Doctoral degree: $1,532
- Professional degree: $1,529
- Master's degree: $1,257
- Bachelor's degree: 1,025
- Associate degree: 761
- Some college, no degree: 699
- High school graduate: 626
- Less than a high school diploma: 454
- Average, all workers: 774